

## THE ACANTHOSOMATIDAE (HETEROPTERA) OF NORTH AMERICA

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*Abstract.*—The heteropteran family Acanthosomatidae (Pentatomoidea) is represented in North America by six species, one new, in two genera. The species are diagnosed and figures of the male and female genitalia and notes on the biology and distribution are given. Keys for the identification of genera and species are also provided.

*Key Words.*—Insecta, Heteroptera, Acanthosomatidae, taxonomy, stinkbugs

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Acanthosomatids are stinkbugs (Pentatomoidea) that have two-segmented tarsi and a large, exposed, eighth abdominal segment in males. In other pentatomoids the eighth segment is reduced to a narrow ring at the base of the male genital cup (Schaeffer 1977) and is not visible externally. In most, but not all, genera of acanthosomatids, the female possesses a pair of abdominal structures known as Pendergrast's organs. These organs function during oviposition when the female transfers a secretion from the gland to the newly laid egg mass using her hind legs (Pendergrast 1953). Interestingly, in *Elasmucha*, one of the few genera lacking Pendergrast's organs, maternal brooding of the egg clutch and early instar nymphs is a characteristic behavior (Frost & Haber 1944, Kudo et al. 1989). Although Pendergrast's organs are unique to the acanthosomatids, paired external organs of unknown homology occur on the abdomens of scutellerids (Carayon 1984), asopine pentatomids (Aldrich 1988), cyrtocorids, plataspid and lestoniids (Miller 1971), although usually on males, not females. In male acanthosomatids inconspicuous pheromone secreting dermal glands are found in patches mainly on abdominal sternites V and VI (Staddon 1990).

Kirkaldy (1909) considered the Acanthosomini to be a tribe within the nominate subfamily of Pentatomidae. American workers Van Duzee (1916) and Torre-Bueno (1939a) placed them at the level of subfamily within the Pentatomidae. Subsequently, Kumar (1974) accorded the group family status, and most American workers since then (e.g., Rolston & McDonald 1979, Froeschner 1988) have treated the group as a full family. Kumar (1974) divided the acanthosomatids into three subfamilies and provided diagnoses for the world genera. Rolston & Kumar (1974) provided a key to the genera of the Western Hemisphere.

Acanthosomatids are most abundant in boreal or high latitude temperate regions or in subtropical regions at high elevation. In North America, the family is represented by six species in two genera. Until early in this century, North American species were placed in the genus *Acanthosoma* Curtis. Bergroth (1907) transferred the North American species to the genera *Elasmostethus* Fieber and *Elasmucha* Stål. *Elasmostethus* was revised by Torre-Bueno (1939b) who resolved the dispute

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over synonymies between Barber (1932) and Van Duzee (1935). Torre-Bueno (1939b) recognized three species and provided a key for their separation, but did not describe the genitalic structures on which definitive diagnoses depend. In his initial report of *Elasmotherus interstinctus* (L.) in North America, Barber (1932) included a figure of the male genitalia. Subsequently, McDonald (1966) described and figured the genitalia of males and females of *Elasmotherus cruciatus* and *Elasmucha lateralis*. Kumar (1974) described the male genitalia of *Elasmotherus dentatus* (DeGeer), a synonym of the Holarctic *E. interstinctus* (L.). Kumar also examined the female type of the Mexican *Acanthosoma flammatum* Distant, 1893, and removed it to *Elasmucha* Stål. Until recently, *Elasmucha flammatum* was known only from this single female type. However, I have been able to collect this species in Chiapas, Mexico, and subsequently numerous specimens have been located. In addition, a closely related but separate species was discovered in the Sierra Madres of Mexico with specimens occurring as far north as New Mexico in the United States. I have compared these specimens to Distant's type of *Acanthosoma flammatum* in the British Museum (Natural History). I have also been able to obtain specimens of *Elasmotherus interstinctus* (L.) from Alaska and have compared these to European specimens determined as either *interstinctus* or its synonym *dentatus*. I, therefore, have been able to study the genitalic structures of all five previously described species reported from North America and confirm their correct identity. In the present article I provide a description and comparison of the external morphology, including the male and female genitalia, for all six North American species.

#### KEY TO THE NORTH AMERICAN GENERA OF ACANTHOSOMATIDAE

1. Scent gland ruga auriculate, short, extending only half-way to metapleural margin; females lack glandular structures on abdominal segments VI and VII ..... *Elasmucha*
- Scent gland ruga elongate, extending three-quarters of the distance to metapleural margin; females with glandular structures, visible as darkened, ovoid depressions on abdominal segments VI and VII .... *Elasmotherus*

#### ELASMUCHA STÅL

*Clinocoris* Hahn 1834:70 [not Fällén 1829]. (Type-species: *Cimex ferrugatus* Fabr.)  
*Elasmucha* Stål 1864:54.

*Meadorus* Mulsant & Rey 1866:238, synonymized by Kumar (1974). Type-species: *Cimex griseus* L., designated by Kirkaldy (1909).

*Pseudostollia* Breddin 1901:65. (Type-species: *Acanthosoma delicatula* Walker, by monotypy), synonymized by Kumar (1974).

*Galasastra* Breddin 1903:205. (Type-species: *Galasastra salebrosa* Breddin, by monotypy), synonymized by Kumar (1974).

*Type-species.* — *Cimex ferrugatus* Fabr. designated by Kirkaldy (1909).

*Diagnosis.* — *Elasmucha* can be separated from other North American genera of Acanthosomatidae by the following character combinations: the anteclypeus is slightly longer than paraclypei; the first antennal segment reaches and slightly surpasses the apex of the paraclypeus; the mesosternal carina are elevated, projecting over the prosternum, with the carina received by a groove in the proster-

num; the margins of the prosternal groove are elevated and carinate; the scent gland ruga is auriculate and broad, reaching half-way to the metapleural margin; the base of the abdomen has an anteriorly projecting spine that reaches to the mesocoxae. Females lack Pendergrast's organs on abdomen.

Key to North American Species of *Elasmucha*

1. Anterolateral pronotal margin carinate, weakly reflexed; abdominal sternites with dark spot on each side (mainly Mexico) . . . . . 2
- Anterolateral pronotal margin obtuse; abdominal sternites without dark spot laterally (USA & Canada) . . . . . *lateralis*
- 2(1). Rostrum of moderate length, in repose attaining spine-bearing abdominal segment (second visible); male paramere with an angular tooth laterally (Fig. 3) . . . . . *cordillera*
- Rostrum long, in repose attaining at least third visible abdominal segment; male paramere subcapitate and bent (Fig. 1) . . . . . *flammatum*

*Elasmucha lateralis* (Say)

(Figs. 2, 7)

*Edessa lateralis* Say 1831:3.

*Edessa nebulosa* Kirby 1837:277, synonymized by Uhler (1878).

*Acanthosoma affinis* Westwood 1837:30, synonymized by Distant (1900).

*Acanthosoma nebulosum*: Dallas 1851:307.

*Acanthosoma laterale*: Distant 1881:101.

*Meadorus lateralis*: Van Duzee 1904:73.

*Elasmucha lateralis*: Bergroth 1907:49.

*Clinocoris lateralis*: Van Duzee 1908:109.

*Types*.—Not examined. Say collection largely destroyed (Beidleman 1986).

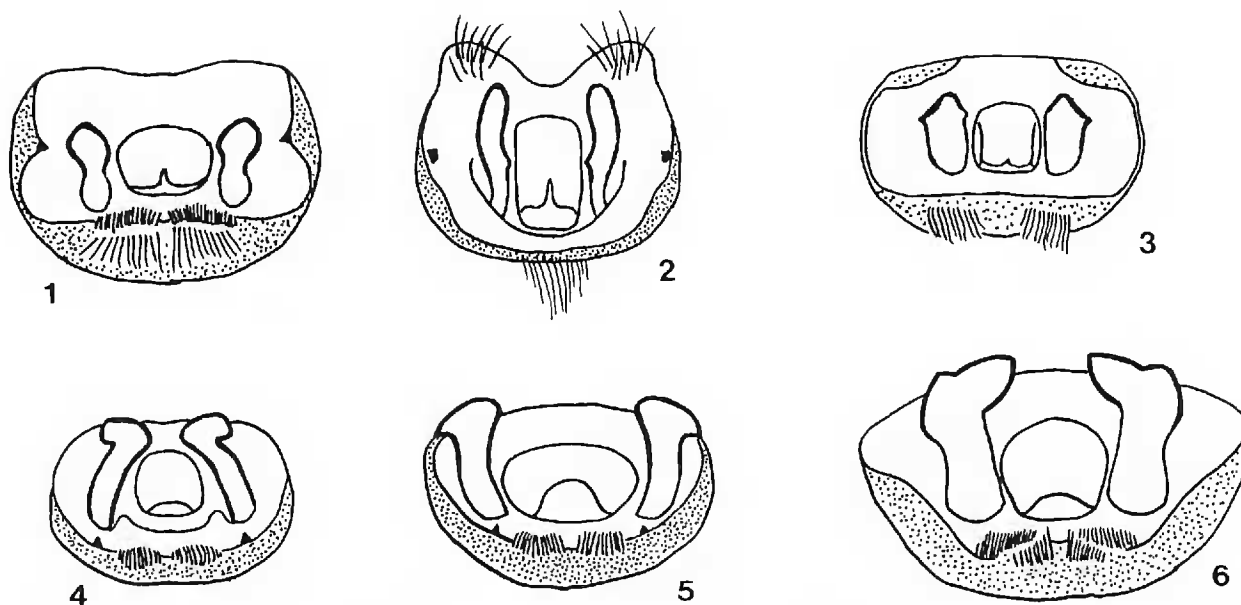
*Redescription*.—*Male*. Dorsal color yellow with tan or brown mottling; connexivum alternately yellow medially and red-brown near sutures; legs immaculate. Head, pronotum and scutellum with coarse dark brown punctures; punctures on hemelytral corium smaller. Pleura densely brown punctate; abdominal venter with few punctures. Length 6–9 mm. Antennal segment I thickest and longest, segment II almost as long as I, V shortest, III and IV subequal. Rostrum attains second or third visible abdominal sternite in repose. Mesosternum with elevated carina projecting over prosternum. Base of abdomen with anteriorly projecting spine which projects over metasternum reaching mesocoxae, its apex acute and lying aside mesosternal carina. Pendergrast's organs absent. Dorsoposterior margin of proctiger with reflexed carina bearing erect spine mesially. Pygophore with fringe of setae on ventro-posterior margin (Fig. 2); on each side, lateral margin at middle with sclerotized cusp; dorsoposterior margin deeply emarginate, emargination flanked on each side by setose lobes. Parameres elongate, undulate.

*Female*.—Basal gonocoxites longer than wide (Fig. 7). Eighth paratergite with deep, U-shaped mesial emargination; spiracles present.

*Diagnosis*.—See the key to species of *Elasmucha*.

*Biology*.—The primary hosts are birch and beech trees (Jones & McPherson 1980). A good account of the biology is given by McPherson (1982). The brooding behavior was studied by Frost & Haber (1944). I have collected *E. lateralis* in numbers on beech on the margins of lakes in Ontario and Manitoba.

*Distribution*.—Maine to British Columbia, south to Tennessee in the east, to Nevada in the west. Froeschner & Halpin (1981) report it from Alaska. I have seen one specimen from Dallas, Texas, which I consider probably mislabeled.



Figures 1–6. Male genital capsule, caudal view. Figure 1. *Elasmucha flammatum*. Figure 2. *Elasmucha lateralis*. Figure 3. *Elasmucha cordillera*. Figure 4. *Elasmotherus interstinctus*. Figure 5. *Elasmotherus cruciatus*. Figure 6. *Elasmotherus atricornis*.

*Material Examined.*—USA. CALIFORNIA. *MARIPOSA Co.*: Yosemite Natl Park, 4 Sep 1974, A.J. Gilbert, ex *Soldidago*, 1 female. MICHIGAN. *IRON Co.*: 29 Jul 1975, C. Buskirk, 1 female. *MARQUETTE Co.*: Champion, 14 Jun 1977, D. Flynn & J. Mahar, 1 male. MINNESOTA. *BECKER Co.*: Itasca St Park, 28 Jun 1984, N. Downie & J. Wappes, 1 male. *CROW WING Co.*: 4 Jul 1983, D.L. Caldwell, 1 female. *ITASCA Co.*: Deer Lake, 15–21 Jun 1986, D.A. Rider, 5 males, 3 females. NEW JERSEY. *MONMOUTH Co.*: Lincroft, 30 Jul 1979, A. Hook, 1 female. NEW YORK. *ESSEX Co.*: Whiteface Mtn, 16 Jul 1990, J. Huether, 2 males, 3 females. OREGON. *LINCOLN Co.*: Agate Beach, 15 Jun 1976, R.L. Westcott, in beach wash, 1 female. PENNSYLVANIA. *ALLEGHENY Co.*: Pittsburgh, 14 Jun 1982, D. Colterrah, on birch, 2 males, 1 female. TEXAS. *DALLAS Co.*: Dallas, 5 Apr 1981, J. Wellso, 1 male. VIRGINIA. *WASHINGTON Co.*: Clinch Mtn, Hidden Valley, 24 May 1990, B. Kondratieff, J.L. Welch, R.F. Kirchner, 1 male. WASHINGTON. *KING Co.*: Hwy I-90 & S Fork of Snoqualmie River, 15 May 1988, M.E. Rice, 1 female. CANADA. *BRITISH COLUMBIA*: Lions Bay, 7 Jul 1988, D.B. Thomas, 3 males, 6 females; Spahats Creek Prov Park, Spahats Creek, 17 Aug 1986, P.H. Arnaud, 2 males, 2 females. *ONTARIO*: Quetoco Prov Park, 8–9 Aug 1978, D. Legg, 2 males, 1 female.

*Elasmucha flammatum* (Distant)  
(Figs. 1, 8)

*Acanthosoma flammatum* Distant 1893:458.

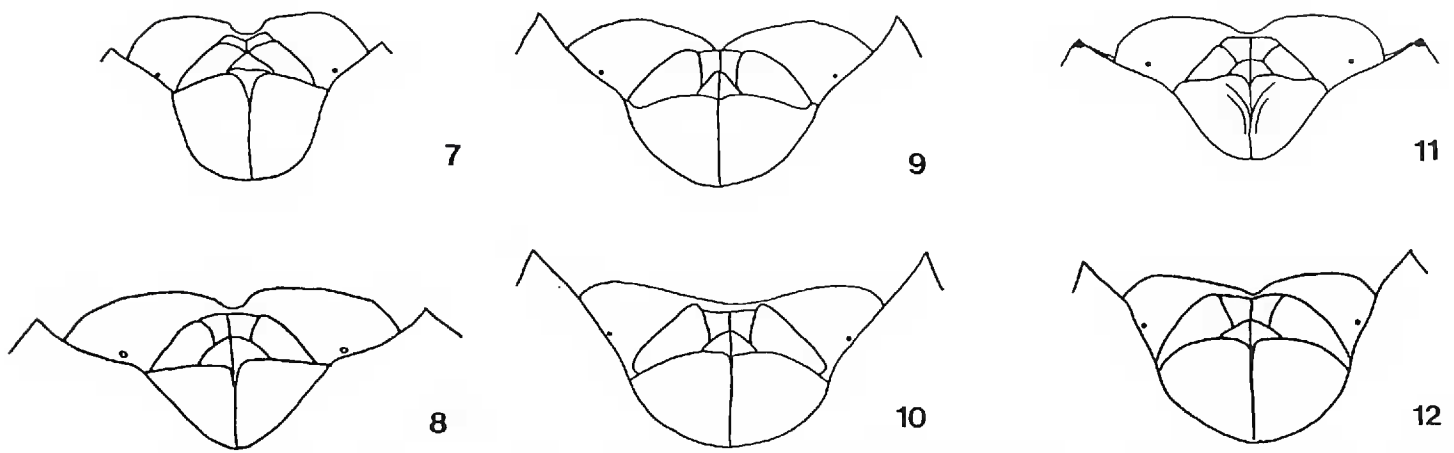
*Elasmucha flammatum*: Kumar 1974:49.

*Types.*—*Holotype*, female, data: MEXICO. *GUERRERO*: Omilteme, July, H.H. Smith; deposited in the British Museum (Natural History), London.

*Redescription.*—*Male*. Dorsal color yellow-tan with dense red-brown punctation. Connexivum alternately yellow mesially, dark brown near sutures. Pleura punctate; legs immaculate. Length 7–11 mm. Antennal segment II longest, I shortest, III, IV and V subequal. Rostrum long, attaining third or fourth visible abdominal sternite in repose. Anterolateral pronotal margin weakly reflexed, carinate. Abdominal sternites with shagreened, dark spot on each side just mesad of trichobothria. Pendergrast's organs absent. Proctiger with low, carinate fold mesially on dorsal surface. Ventroposterior lip of pygophore bearded with double row of setae: ental row short and dense, ectal row long, paler, both rows interrupted mesially (Fig. 1). Lateral margin of pygophore with sclerotized cusp on each side at middle. Dorsoposterior margin of pygophore not deeply emarginate. Parameres asymmetrically clavate.

*Female*. Similar to male except distinctly larger and paler. Basal gonocoxites about equally long as wide (Fig. 8). Eighth paratergite with deep U-shaped emargination mesially; spiracles present.

*Diagnosis.*—See the key to the species of *Elasmucha*.



Figures 7–12. Female genital plates, ventral view. Figure 7. *Elasmucha lateralis*. Figure 8. *Elasmucha flammatum*. Figure 9. *Elasmostethus atricornis*. Figure 10. *Elasmostethus cruciatus*. Figure 11. *Elasmucha cordillera*. Figure 12. *Elasmostethus interstinctus*.

**Biology.**—I collected two specimens at light at two different localities in Chiapas. One of these locations, El Chorreadero, is a tropical deciduous forest; the other, near Cuxtepeques, is a pine-oak forest. Both collection localities were montane riparian habitats.

**Distribution.**—Mexico and Guatemala.

**Material Examined.**—GUATEMALA. Bananera, Apr 1930, J.J. White, 1 male. MEXICO. CHIA-PAS: Cuxtepeques, 15 Jun 1987, D.B. Thomas & A.M. Mendoza, 1 male; Chorreadero Cyn, 9 km E of Chiapa de Corzo, 18 Sep 1985, D.B. Thomas, B.C. Ratcliffe & C. Messenger, 1 female; Chorreadero, 26 May 1987, D.A. Rider, D.B. Thomas, E.G. & T.J. Riley, 1 female; Municipio Pantepec, road from Rayon between Pantepec and Tapalapa, 1707 m, 22 Sep 1981, D.E. Breedlove, 1 female. NUEVO LEON: 29 km W of Linares, 23 Jul 1976, Peigler, Gruetzmacher, Murray & Schaffner, 3 males, 4 females; Monterrey, 4 Nov 1978, L.M. Koenig, 1 male. VERACRUZ: Fortin de las Flores, Planta de la Cerveceria Moctezuma, 17–18 May 1965, D. Rabago, 1 male, 1 female.

*Elasmucha cordillera* Thomas, NEW SPECIES  
(Figs. 3, 11, 13)

**Types.**—*Holotype*, male, data: NEW MEXICO. CATRON Co.: Whitewater Forest Camp, 9 km (5 mi) NE of Glenwood, 21 Aug 52, H.B. Leech & J.W. Green; deposited, California Academy of Sciences, San Francisco. Paratypes: 6 males and 6 females. One male, data: NEW MEXICO. SANTA FE Co.: 10 Jul 1940, D.J. & J.N. Knull; deposited in the personal collection of D.B. Thomas. One male, data: MEXICO. OAXACA: 10 km N of Oaxaca, 1900 m, 13 Sep 1986, R. Baranowski, sifting litter at small stream, trop. mont. forest; deposited, private collection of D.A. Rider. Two males, 5 females, data: MEXICO. “2390,” C.F. Baker; deposited, United States National Museum of Natural History. One male, data: MEXICO. San Antonio, “No. 114,” 1 May 1945, with leaf mold; deposited, United States National Museum of Natural History. One female, data: MEXICO. MEXICO D.F.: L. Conradt; deposited, United States National Museum of Natural History. One male, data: GUATEMALA. Bananera, Apr 1930, J.J. White; deposited, United States National Museum of Natural History.

**Description.**—*Male*. Elongate-oval (Fig. 13), depressed dorsally, convex ventrally. Color yellow with dense, irregularly dispersed, red-brown punctations. Length from tip of tylus to apex of abdomen: 6.5 mm. **Head:** elongate; tylus gradually widened apically and slightly surpassing juga. Antennal segments variably black or darkened; segment I shortest, II longest, III, IV and V subequal. Rostrum in repose attaining base of abdominal sternite III (second visible). **Thorax:** anterolateral pronotal margin with obtuse reflexure; weakly concave in dorsal view. Humeri obtuse, not produced. Corium with lateral

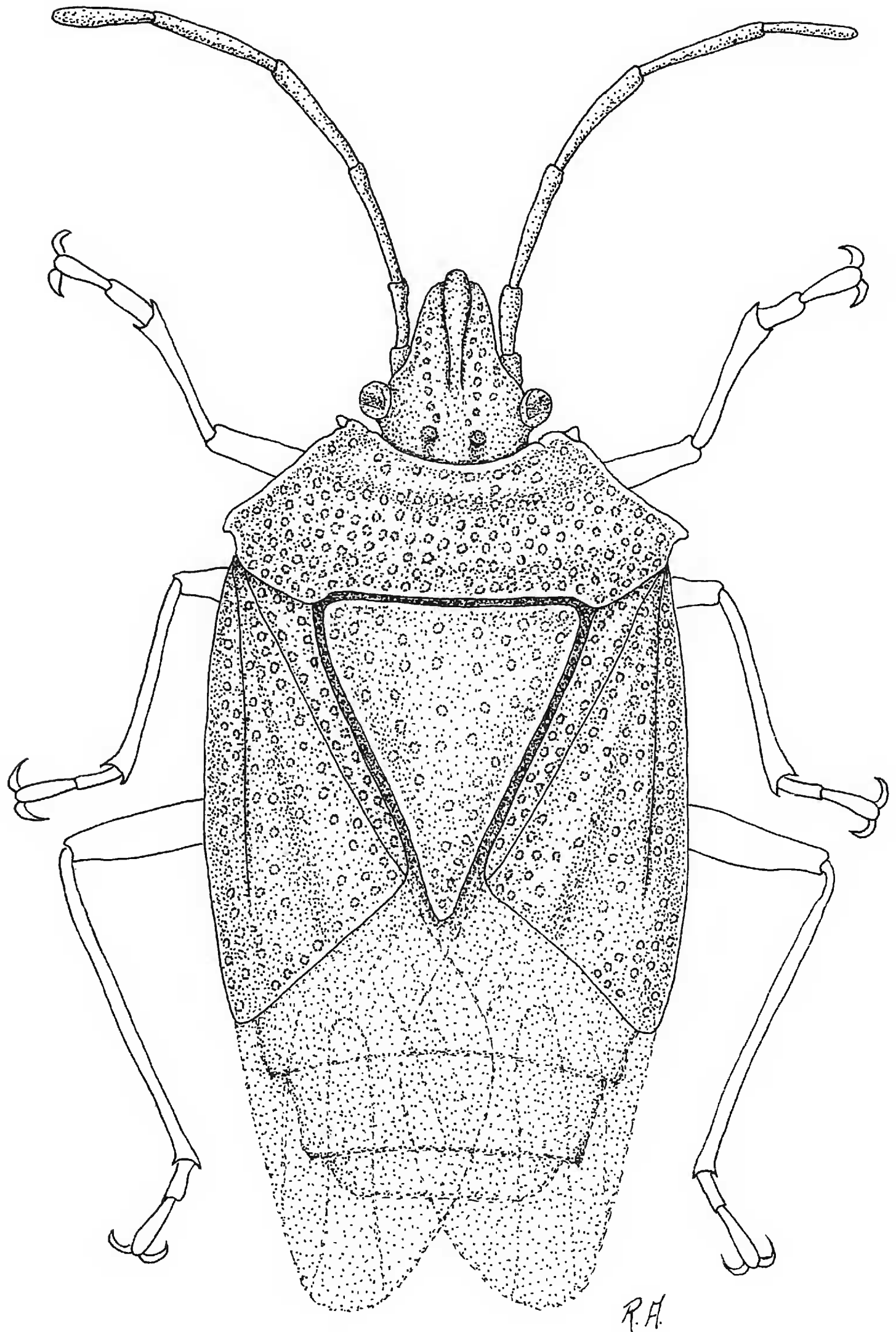


Figure 13. *Elasmucha cordillera*, dorsal habitus.

punctures larger and denser. Scent gland auricle reaching almost one-half distance to metapleural margin. Pleura strongly punctate. Legs yellow, tibia terete, except protibiae prismatic distally. *Abdomen*: venter yellow, impunctate; each sternite with round dark spot on each side just mesad of spiracle. Connexivum appearing alternate with apex of each segment having a broad nearly square dark spot. *Genitalia*: ventral margin of pygophore bearded with thick fringe of setae each side of middle; lateral margin without tooth or spinous process (Fig. 3). Proctiger with small triangular tooth at middle on posterior margin. Parameres thick, compressed; ectal margin with small acute angular tooth-like projection (Fig. 3).

*Female*.—Length 8.0 mm. Basal gonocoxites with strong longitudinal wrinkles near and parallel to mesial margin. Posterior margin of ninth tergite with U-shaped mesial emargination; spiracles present (Fig. 11).

*Diagnosis*.—Definitive separation of this species from the others in the genus requires examination of the male genitalia. The male paramere has an angular tooth on the lateral margin that is lacking in the others.

*Remarks*.—The last mentioned paratype, from Bananera, Guatemala, may be mislabeled because it bears a collection label that is identical with a specimen of *flammatum*. Because both specimens are males, they are easily differentiated. Many of the paratypes bear no other locality information than "Mex." The range of this species is, therefore, open to question. Reliably labeled males are from New Mexico, in the United States, and Oaxaca, in Mexico.

*Material Examined*.—see types.

#### ELASMOSTETHUS FIEBER

*Elasmostethus* Fieber 1860:78.

*Cypostethus* Fieber 1860:78. (Type-species, *Cimex tristriatus* Fabr. by monotypy), synonymized by Kumar (1974).

*Oxydalus* Mulsant & Rey 1866:247. (Type-species: *Cimex dentatus* DeGeer, by monotypy), synonymized by Stål (1868).

*Elasmatostethus* Marshall 1868:281. [invalid emendation].

*Stictocarenum* Stål 1871:638. (Type-species: *Rhynchoris ligatus* Erichson, by monotypy), synonymized by Kumar (1974).

*Dichobothrium* Breddin 1903:207. (Type-species, *Dichobothrium sastragaloides* Breddin), designated by Kirkaldy (1909), synonymized by Kumar (1974).

*Ditaenius* Bergroth 1912:361. (Type-species, *Cimex emeritus* Bergroth, by monotypy), synonymized by Kumar (1974).

*Type-species*.—*Cimex dentatus* DeGeer [= *Cimex interstinctus* L.], by monotypy.

*Diagnosis*.—The following characters and states separate *Elasmostethus* from other New World genera of Acanthosomatidae: The anteclypeus is longer than paraclypei; the apex of antennal segment I clearly surpasses the anteclypeus; the mesosternum has an elevated carina projecting over the prosternum which is received by a groove in prosternum; the margins of the prosternal groove are elevated and subcarinate; the base of abdomen is produced forward as an elongate spine lying along side of the mesosternal carina and projects over the metasternum to the mesocoxae; the scent gland ruga are straight and elongate, about five times longer than wide, and reaching three-quarters of the distance to metapleural margin. Pendergrast's organs are present on the abdomen of females. These are glandular structures appearing as small, darkened, ovoid depressions on each side of

the abdomen, near the posterior border of sternite VI and the anterior border of sternite VII.

Key to North American Species of *Elasmotherus*

1. Pronotal disc and head with many dark punctures; first antennal segment pale . . . . . 2
- Pronotal disc and head without dark punctures; first antennal segment dark . . . . . *atricornis*
- 2(1). Abdominal venter with row of dark spots on each side . . . . . *interstinctus*
- Abdominal venter immaculate . . . . . *cruciatus*

*Elasmotherus interstinctus* (L.)  
(Figs. 4, 12)

*Cimex interstinctus* L. 1758:445.

*Cimex dentatus* DeGeer 1773:260. Synonymized by Kirkaldy (1909).

*Cimex haemagaster* Schranck 1781:270. Synonymized by Kirkaldy (1909).

*Cimex bidens* Gmelin 1789:2149 [not Linnaeus 1758]. Synonymized by Kirkaldy (1909).

*Cimex arboreus* Gmelin 1789:2160. Synonymized by Kirkaldy (1909).

*Cimex collaris* Fabricius 1803:170 [homonym]. Synonymized by Stål (1868).

*Pentatoma liturata* Latreille 1804:192. Synonymized by Kirkaldy (1909).

*Pentatoma stollii* Le Pelletier & Serville 1825:53. Synonymized by Kirkaldy (1909).

*Acanthosoma haematogaster* (sic): Burmeister 1835:360.

*Meadorus interstinctus* Mulsant & Rey 1866:238.

*Acanthosoma dentatum*: Saunders 1892:39. Synonymized by Horvath (1899).

*Elasmotherus interstinctus*: Horvath 1899:366.

*Types*.—*Cimex dentatus* DeGeer [= *Cimex interstinctus* L.] designated by Stål (1864). Not examined.

*Redescription*.—*Male*. Dorsal color green-yellow with variable red tinge. Connexivum uniformly yellow. Dense black punctations on head, pronotum, scutellum and corium. Venter yellow, impunctate. Legs immaculate. Abdominal sternites with shagreened, dark, oval spot on each side just mesad of trichobothria. Length 8–10 mm. Antennal segment IV longest, I and III shortest, II and V subequal, longer than I and III. Rostrum in repose attaining metacoxae. Anterolateral pronotal margin calloused. Mesosternal carina elevated, projecting over prosternum and received by prosternal groove, margins of groove elevated, subcarinate. Scent gland ruga elongate, attaining three-fourths distance to metapleural margin. Posterior margin of proctiger arcuate, reflexed. Ventro-posterior margin of pygophore bearded with fringe of setae, interrupted mesially; margin of pygophore either side of fringe bearing sharp, sclerotized tooth (Fig. 4). Paramere elongate, compressed, with asymmetrical quadrate head.

*Female*.—Basal gonocoxites slightly wider than long (Fig. 12). Eighth paratergite undulately emarginate in caudal view; spiracles present.

*Diagnosis*.—See the key to the species of *Elasmotherus*.

*Biology*.—This bug is known as the “birch bug” in England. Kirkaldy (1909) also lists alders, beech and aspen as hosts. Staddon (1990) has studied the distribution of pheromone glands and the chemistry of their secretions.

*Distribution*.—Holarctic: Alaska, Northwest Territories of Canada, northern Europe and Asia.



*Material Examined.*—USA. ALASKA. Delta Junction, Fourth judicial district, Aug 1981, C. Papp, 3 males, 2 females. GREAT BRITAIN. ENGLAND. NORFOLK: Thetford, 16 Sep 1977, A.J. & M.E. Gilbert, 1 male; Cambridge, Wicken Fen, 16 Sep 1977, A.J. & M.E. Gilbert, 1 female.

*Elasmostethus cruciatus* (Say)  
(Figs. 5, 10)

*Edessa cruciata* Say 1831:2.

*Acanthosoma borealis* Westwood 1837:30. Synonymized by Distant (1900).

*Acanthosoma cruciata*: Uhler 1861:23.

*Acanthosoma cruciata* var. *cooleyi* Van Duzee 1904:74.

*Elasmostethus cruciatus*: Bergroth 1907:49.

*Elasmostethus cooleyi*: Bergroth 1907:49. Synonymized by Torre-Bueno (1939b).

*Types.*—Not examined. Say collection reportedly destroyed (Beidleman 1986).

*Redescription.*—*Male.* Dorsal color yellow-tan with red band on ental margin of hemelytral corium. Red-brown punctures dense on pronotum, scutellum and most of corium, sparse on head and large spot on endocorium. Connexivum uniformly yellow. Venter yellow impunctate, immaculate; apices of last abdominal sternite red. Legs immaculate. Length 8–11 mm. Antennal segment III shortest, II, IV and V subequal, longer than I. Rostrum attains metacoxae in repose. Anterolateral pronotal margin calloused. Posterior margin of proctiger bluntly acuminate, broadly reflexed. Ventroposterior margin of pygophore bearded with dense fringe of setae, interrupted mesially; margin either side of fringe with a sharp, sclerotized tooth (Fig. 5). Paramere elongate, compressed, with ovoid head which has outer, apical margin deflexed.

*Female.*—Basal gonocoxites about as long as wide, posterior margin arcuate (Fig. 10). Posterior margin of eighth paratergite broadly V-shaped in ventral view with weak mesial emargination; spiracles present.

*Diagnosis.*—See the key to the species of *Elasmostethus*.

*Biology.*—Jones & McPherson (1980) report that this species feeds and reproduces on alders. McPherson (1982) provides notes on collection records, distribution and parasites. I have collected this species in numbers on alders in Nevada and in British Columbia.

*Distribution.*—Labrador to British Columbia in Canada, south to California, Texas and South Carolina.

*Material Examined.*—USA. CALIFORNIA. SHASTA Co.: Burney, 20 Aug 1969, R.P. Allen, 3 males, 3 females. COLORADO. LARIMER Co.: Cameron Pass, 19 Aug 1948, D.G. Denning, 1 female. NEVADA, DOUGLAS Co.: Carson City, Spooner Ridge, 6 Jul 1978, on *Alnus tenuifolia*, 3 males, 2 females. NEW YORK. ESSEX Co.: Whiteface Mt, 11 Jul 1990, J. Heuther, 2 males, 3 females. WASHINGTON. THURSTON Co.: Millersylvania St Park, nr Maystown, 53 m, 11 Jul 1988, E.L. Sleeper, 1 male. WYOMING. ALBANY Co.: Laramie, Pole Mtn, 7 Jul 1948, D.G. Denning, 1 male, 1 female. CANADA. BRITISH COLUMBIA: Lions Bay, 7 Jul 1988, D.B. Thomas, 1 male, 1 female; Vancouver, UBC campus, S.E. Woods, 2 Jul 1988, E.L. Sleeper, 1 male, 1 female. MANITOBA. Whiteshell Prov Park, South Cross Lake, 13 Aug 1983, D.B. Thomas & J.E. Pasek, 1 female.

*Elasmostethus atricornis* (Van Duzee)  
(Figs. 6, 9)

*Acanthosoma atricornis* Van Duzee 1904:75.

*Elasmostethus atricornis*: Kirkaldy 1909:177.

*Types.*—Not examined.

*Redescription.*—*Male.*—Dorsal color yellow with humeral angles of pronotum and antennae black; scutellum basally and broad ental margin of hemelytral corium infuscated. Venter yellow with apices

of last abdominal segment orange. Anterior pronotum and head with colorless punctures; base of pronotum, corium and scutellum with scattered brown punctures. Venter and legs immaculate. Length 8–10 mm. Antennal segments II and IV longest, subequal, III and V shortest, subequal; rostrum attaining mesocoxae in repose. Anterolateral pronotal margins obtuse. Ventroposterior border of pygophore bearded with double row of setae, ental row short dense, ectal row longer, interrupted mesially; margin of pygophore lacking teeth or cusps (Fig. 6). Proctiger broad, obtusely acuminate distally, apex broadly reflexed. Head of paramere angulate, capitate, feebly bilobate.

*Female*.—Basal gonocoxites about as long as broad; posterior margin of eighth paratergite symmetrically biarcuate in ventral view; spiracles present (Fig. 9).

*Diagnosis*.—See the key to the species of *Elasmotherus*.

*Biology*.—This species breeds on *Aralia racemosa* L. (Blatchley 1926, Jones & McPherson 1980).

*Distribution*.—Quebec to Montana, south to South Carolina (McPherson 1982).

*Material Examined*.—USA. NEW YORK. *TOMPKINS Co.*: Ithaca, 13 Sep 1952, W.D. Stockton, 1 male, 2 females. CANADA. *QUEBEC*: 20 km SE of Kazabazua, 29 Jul 1989, B.D. Gill, 3 males, 3 females.

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